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WEATHER INDICATING PLANTS OF TRIBALS IN SOUTHERN RAJASTHAN

PRABHAKAR JOSHI

Department of Botany, University of Rajasthan, Jaipur

ABSTRACT

The communication deals with plants recognised as weather-indicators in tribal societies inhabiting the state of Rajasthan. An account of eight species is given categorised into plants signalling conditions of weather :

(i) well in advance
(ii) slightly before onset of forecasted conditions
(iii) pertaining to grain yield
(iv) prevailing at a time

Brief notes on the utility of these plants amongst the tribals are also appended.

INTRODUCTION

The evolution of tribal societies in close communion with mother's nature has enabled man to imbibe in depth knowledge about the countless facts concerning the floral and faunal elements related to them.

As man turned towards agriculture and his crops depended on rain, what weather conditions lay ahead became the main object of concern. The recognition of phenological signals in plants and peculiar behaviour of animals which were to precede some characteristic weather events were most probably his accidental discoveries that were followed by a quest for knowing more about them. During the course of time, consistent observation of events following particular signals made him develop some meaningful weather proverbs and folklore which were remembered and transferred through generations as oral heriditary treasure. We are familiar with examples of plants, their various phenomenon correlated with changes in weather conditions and their implications specially in the economy given in ancient Indian texts. Majumdar (1927) points out some of the plants that are mentioned in the *Brihat samhita*, e.g. *Madhuca* sp. dried fruits powder is taken as a cheap substitute to wheat in the period when these are abundantly produced and wheat is scarce. *Acacia catechu* Willd. showing overgrowth is indicative of famine and a similar behaviour of *Terminalia arjuna* (Roxb. ex DC.) Wt. & Arn. predicted good rains.

Southern Rajasthan, the home of the major tribal population of the state *viz.*, Bhils, Garasias, Damors and Kathodias spread over the districts of Banswara, Chittorgarh, Dungarpur, Sirohi and Udaipur, is littered with the South-western portion of the Aravalli hill ranges and characterized by dry deciduous vegetation pattern, but for Abu which surprisingly is of a sub-tropical evergreen pattern. First hand data on the role of plants in the folklores, songs and proverbs prevailing among these people was also collected during ethnobotanical investigations of these tribes carried out by the author since 1980.

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The present report deals with some such information from the oral lores of the tribes of Southern Rajasthan regarding the forecasting of weather on the basis of particular changes appearing in certain plants. The weather indicating signals noted by the tribes alongwith the deductions of atmospheric conditions are being presented here. A brief account of the botany of the plants discussed together with notes throwing light on the utility of weather indicators in the tribal lives is also given.

I. PLANTS SIGNALLING WEATHER CONDITIONS WELL IN ADVANCE

Madhuca longifolia (Koen.) Macbr. (Sapotaceae). *Mahuwa.*

A large deciduous tree with cream coloured flowers and fleshy baccate fruits.

Flowering : March-April. *Fruiting* : May-June.

Uses : The succulent globular corolla and the berry are eaten either raw or cooked. Local liquor is brewed from them. The seeds (DOLMA) too are edible, the oil expressed is used for cooking. Flowers, fruits and the seeds are sources of income.

Medicinal : A hot poultice of leaves is applied locally, in abdominal pains, fractures and sprains ; 'laddoos' prepared of the baked flowers alongwith *Sesamum* seeds are eaten to relieve coughs and colds ; and as animal feed in regulated doses the flowers are given to cure malnutrition in cattle.

Signal : The Bhils forecast rich rains when the *Mahuwa* tree is found heavily laden with fruits not normally seen.

Sterculia urens Roxb. (Sterculiaceae). *Kadai.*

A rare tree occurring on hill tops and slopes. Large, five-lobed leaves are crowded at the end of branches. The olive-yellow flowers are borne in terminal panicles.

Flowering and fruiting : February-May.

Uses : Roasted seeds are edible. The gum of the tree is an income source.

Medicinal : The paste of fresh green leaves is applied as ointment on cracked/chapped skin.

Signal : At times when the *'Mor'* (inflorescence) and the leaves are seen together as an uncommon feature throughout the forest it is assumed that the oncoming weather will fetch plentiful rains.

Diospyros melanoxylon Roxb. (Ebenaceae). *Timru, Tendu...*

A dioecious tree with coriaceous leaves (shed in winter). Male flowers whitish in axillary cymes, female ones larger, solitary axillary. The yellow, globose, ovoid, pulpy berries are astringent.

Flowering : April-May. *Fruiting* : June-November.

Uses : A bread winning tree of Bhils, cherished for the 'bidi' leaves and the sweet edible fruits.

Medicinal : The seed kernel is used as a cure for dysentery (Joshi, P., 1982).

Signal : (i) An unusually bountiful fruit setting in *Timru* is not taken as a good sign as it is said to indicate famine. Kind and merciful nature, according to Bhils provides abundant edible *Timru* fruits enabling them to tide away the bad times ahead.

(ii) The Garasias of Abu Road (Sirohi) interpret the profuse flowering of this very tree surpassing normal limits as a signal for good rains.

II. PLANT SIGNALLING SLIGHTLY BEFORE ONSET OF FORECASTED WEATHER CONDITIONS

Securinega virosa (Roxb. ex Willd.) Baillon (Euphorbiaceae). *Helpi, Helapi.*

An undershrub with branches spreading all around trunk. Flowers white, in axillary crowded bunches, male and female borne in different places.

Flowering and fruiting : June-September. Flowers chiefly during rains.

Uses : The fruit with white fleshy pulp is edible.

Signal : The tribals (Bhils) claim that the onset of flowering in the *Helpi* tree coincides with closely following rains.

N.B. As soon as the blossomming of the *'Mors'* (inflorescence) is sighted the tribals, expecting rains to arrive any time joyfully exclaim *'Helpi Pur Mor Khule'* i.e. the *Mors* have opened in *'Helpi'*, reporting it to others.

The more profuse bunches of flowers (*Mors*), the richer are the rains expected.

III. PLANTS SIGNALLING WEATHER CONDITIONS PERTAINING TO GRAIN YIELD

Boswellia serrata Roxb. ex Colebr. (Burseraceae). *Salar, Halar.*

A medium sized deciduous tree with papery bark, occurring more commonly on hill tops. Flowers white, fruits are drupaceous and over a centimeter long.

Flowering : April-June. *Fruiting* : End of the year.

Uses : Gum is used as incense in rituals, ceremonies and magico-medicine. In Kushalgarh region (Banswara) it has a cosmetic value—by peeling off the film of warmed gum applied locally, unwanted hair is removed. It is a source of income. The wood, important in the construction of various items is considered auspicious.

Signal : Appearance of ample *'Beej'* (fruit) on this tree is taken as an indicator of appropriate weather for grain ripenning by the Garasias.

Tamarindus indica L. (Caesalpiniaceae). *Amli.*

A popular large, evergreen tree with an extensive shady crown and sub-compressed falcate pods.

Flowering : May-June. *Fruiting* : July-December.

Uses : Valued for the fruit pulp. The Kathodias cook the flowers as vegetable. The fruit is collected and sold.

Signal : When the length of fruits of this tree appear longer than usual, and is a common phenomenon in the forest—a splendid weather with abundant rains and a weather conducive to the abundant ripenning of GENHU (*Triticum aestivum* L.) and CHINNA (*Cicer arietinum* L.) is forecasted.

IV. PLANTS INDICATING WEATHER CONDITIONS PREVAILING AT A TIME

Cucumis melo L. var. **agrestis** Naud. (Cucurbitaceae). *Kachri, Kaachra.*

An annual, creeping, tendrillar herb, with a smooth, ellipsoid or turbinate fruit which has pale green longitudinal stripes and is yellow when ripe.

Flowering and Fruiting : July-September.

Uses : The fruit is edible—raw or cooked as vegetable.

Ziziphus nummularia (Burm. f.) Wt. and Arn. (Rhamnaceae).

A common spiny bushy shrub.

Flowering : May-September. *Fruiting* : October-January.

Uses : The edible fruit is eaten raw or cooked, freshly plucked or in dried form. They are often sold. The plant is important in fencing and also as a fodder source. A totemic plant of a Bhil clan.

Medicinal : The twigs or roots are used for preventing decay and diseases of teeth. The root bark is an ingredient of an abortion recipe (*see* Joshi, P., 1982).

Signal : Joshi, L. (1978) mentions a proverb, *"Kaal Ka Kaachra Ur Sukaal Ka Bor"* in his compilation of proverbs of Mewar. This proverb says that the fruits of KAACHRA are unusually arundant in famine while the luxuriantly fruiting *Bor* are characteristic of good weather.

N.B. On verification it was found that besides the tribal communities, this saying is also prevalent in other regions of Rajasthan.

DISCUSSION

I. *The choice of indicators.*

This list may not be termed as complete and besides these, there may be many more plant species with a weather forecasting value. The possible reasons for the preference of these very species for this purpose may be the following :

(i) Usefulness and intimate association of the species with the tribal societies to the extent that even little changes taking place in them are noted down with concern.

These plants are figured in most of the folk songs sung amongst the tribes.

(ii) Frequent occurrence of these plants in the surrounding areas, many of them growing within or in close proximity of the village and, therefore, offering an opportunity of constant observation by the tribals. *Sterculia urens* is an exception as its numbers have dwindled because of overexploitation so that the plant is rendered the status of a threatened species.

(iii) That the phenological expression of the response to climatic and weather changes in these species is more conspicuous and easily discernible.

Though factors other than these may be responsible, yet the usefulness of the species, coupled with their common occurrence throughout the forest and constant interaction between them and the tribals are definitely the major attributes to their choice as indicators.

II. *The indicating ability.*

Whereas *Boswellia serrata, Diospyros melanoxylon, Sterculia urens* and *Tamarindus indica* are plants that depict weather conditions well in advance, *Securinega virosa* is the species which portrays a particular change in weather close at hand. On the other hand, the expression of fruiting in *Cucumis melo* var. *agrestis* and *Ziziphus nummularia* provide a confirmatory test of the prevailing weather conditions.

In the case of *Diospyros melanoxylon* there appears to be a marked difference of opinion existing among two different tribes inhabiting different parts of S. Rajasthan. While the Bhils of Udaipur district (Jhadol forests) emphatically feel that the excessive *fruiting* of *Diospyros* is an unmistakable indication of a following famine, the Garasias of Sirohi district staunchly claim that the unusually rich *flowering* of *Diospyros melanoxylon* is a precursory signal of good rains. The correlation of the two related conditions in the tree, i.e. flowering and fruiting, where one precedes the other, with the two diametrically opposite conditions of weather that follow though interesting is difficult to understand and as such needs a further probe.

A saying in Bengal runs as "Abundance of mango forebodes an abundance of paddy crop ; and tamarind—flood !" (c.f. Majumdar, 1927). The case of tamarind also becomes quite interesting because about the indicator value of this tree the claim of the tribals rests on the length and not the number of fruits.

CONCLUSION

Unaware of what goes on in the modern world, the tribals, even today depend on their traditional wisdom for preparing themselves for the oncoming weather conditions. Today the metereological forecasting employs the latest tools and techniques including those involved in space research.

The traditional orally conveyed knowledge of these people is just slipping into oblivion under stress of fast urbanization and acculturization of the tribals on the one hand and depletion of floral and faunal resources on the other. The well known example of famine precedented by an excessive flowering in bamboo* (Watt, 1908, "It is an un-

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**Bambusa arundinacea* (Retz.) Roxb.

doubted fact that the flowering of the bamboo is directly influenced by the causes which bring about famine, for the providential supply of food from this source has saved the lives of thousands of persons during several of the great famines of India") has been nearly forgotten by the tribals of Rajasthan which is evidenced by their ignorance of this phenomenon in nearly all the instances where enquiries were made. This probably, is due to the heavy depletion of the species in this region and its complete disappearance in most of the places though it is known that the plant was common in early times (Singh, 1983).

The present tribal knowledge is the result of ages of observation and experience of the tribes. Such observations of not only the 'primitive' people of Rajasthan but of contemporary people in India and the world as well must be collected and conserved lest they disappear completely. The wisdom which has crystallized into time tested proverbs and sayings encompass not only plants but celestial objects, animals and birds, state of insects etc., too. Based on this information estimates of forthcoming weather can be made ranging between an hour or two to weeks or months in advance. The identification, critical study, confirmation and establishment of such sayings on scientific lines can prove to be a useful corollary to the field of modern metereological forecasting at least on a regional scale.

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